

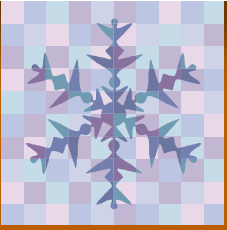


# Cold Weather Safety

DMME

Division of Mineral Mining

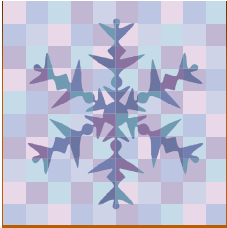
2012



# Cold Weather Hazards

- Hypothermia
- Frost bite
- Slippery walkways/surfaces
- Shoveling snow; heart and back problems
- Heating equipment



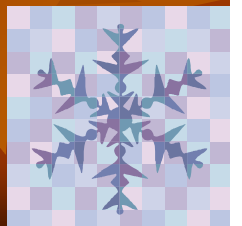


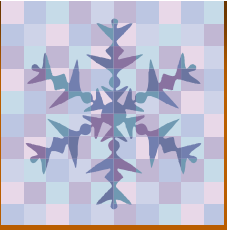
# How To Protect Workers

- Recognize the conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train the workforce about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet and windy conditions. Layer clothing to adjust to changing temperatures.
- Take frequent short breaks in warm dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs).
- Drink warm, sweet beverages (sugar water or sports type drinks).  
**Avoid drinks with caffeine or alcohol.**
- Eat warm, high-calorie foods.

# Workers Are at Increased Risk When...

- They have predisposing health condition such as cardiovascular disease, diabetes, and hypertension.
- They take certain medication (check with your doctor, or pharmacy, and ask if any medicines you are taking affect you while working in cold environments).
- They are in poor physical condition, have a poor diet, or are older.



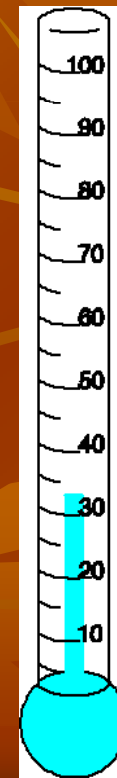


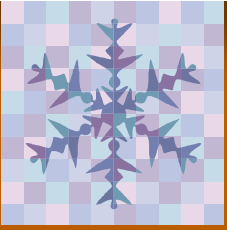
# Hypothermia

**HYPOTHERMIA** is a potentially fatal condition. The body's core temperature has been lowered to the extent that the brain function is impaired and the heart's activity is about to be compromised. Urgent first aid is required.

## SIGNS AND SYMPTOMS:

- Uncontrollable shivering.
- Cool, pale or ashen skin.
- Slurred speech.
- Apathy, confusion or irrational behavior.

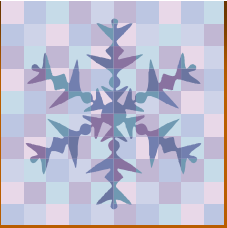




# Hypothermia

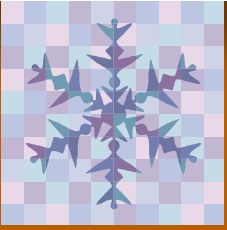
## What Should be Done? (Dry conditions)

- Call for emergency help (911).
- Move the person to a warm dry area. Don't leave the person alone. Remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports type drinks) if they are alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) or alcohol.
- Have the person move their arms and legs to create muscle heat. If they are unable to do this, place warm bottles or hot packs in the arm pits, groin, neck and head areas. **DO NOT** rub the persons body or place them in warm water bath. This may stop their heart.
- Rubbing may cause damage to the skin and tissue.

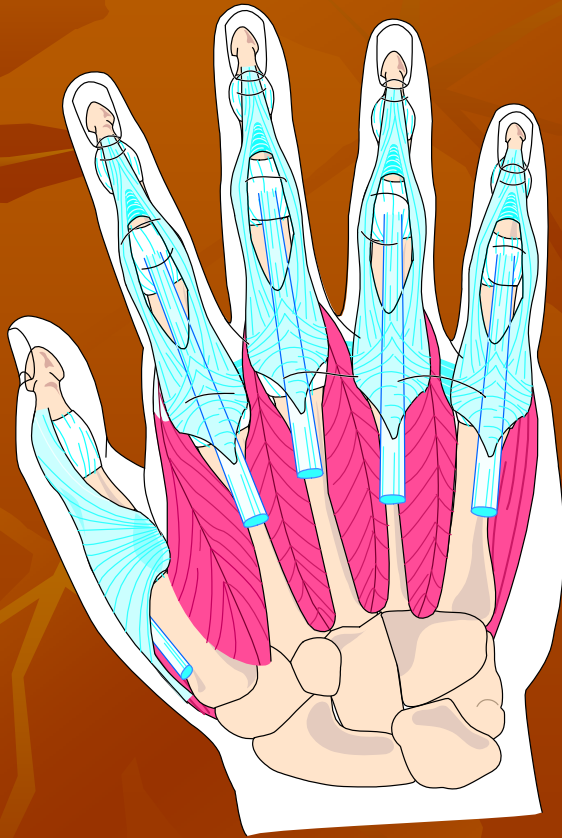


# What Should be Done? (Wet Conditions)

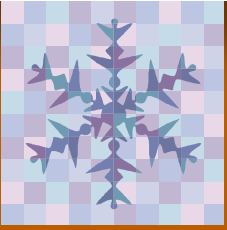
- Call for emergency help (911). Body heat is lost up to 25 times faster in water.
- **DO NOT** remove any clothing. Button, buckle, zip and tighten any collars, cuffs, shoes and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **DO NOT** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses the body's heat and reduces survival time by about 50%.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.



# Frost Nip



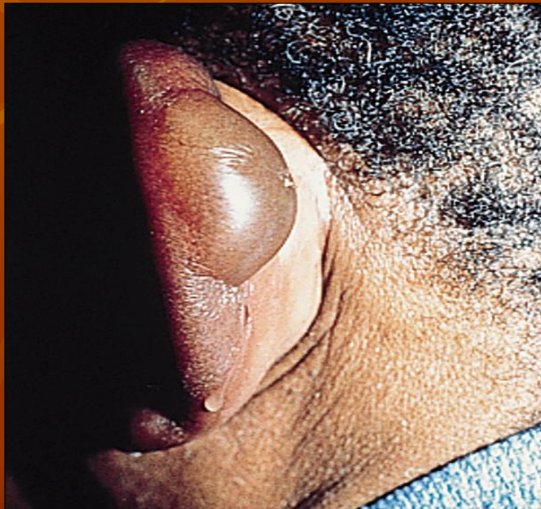
- Frost nip occurs when the surface area of an exposed body part begins to cool and partially freeze. The exposed area may be numb. Body part may be bright red but will later turn a pale color.
- Treatment: move patient to a warm environment. Warm affected area, but do not rub. Patient may experience burning or tingling sensations as the tissue warms.
- May need to seek medical attention.

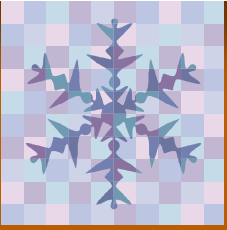


# Frost Bite

## What Happens to the Body:

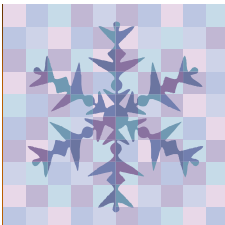
- Freezing in deep layers of skin and tissue. Pale waxy-white skin colors. Skin becomes hard and numb; usually affects the fingers, hands, toes, feet, ears and nose.





# What Should be Done?

- Move the person to a warm, dry area. Don't leave the person alone.
- Remove any wet or tight clothing that may cut off the blood flow to the affected areas.
- DO NOT rub the affected area, because rubbing causes damage to the skin and tissue.
- Gently place the affected area in a warm (105 F) water bath and monitor the water temperature to slowly warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast causing tissue damage. Warming takes about 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement and skin color have returned, the affected area should be dried and wrapped to keep it warm. NOTE: If there is a chance the area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.



# Stay Warm

## Cold + Wind = Frostbite



### Wind Chill Chart



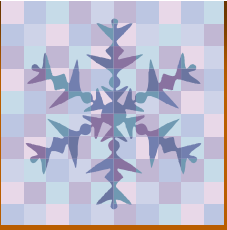
		Temperature (°F)																		
		Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times  30 minutes  10 minutes  5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

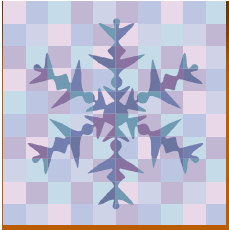
Effective 11/01/01



# Wear Proper Clothing

- **Clothing should protect you from cold, wind, and precipitation and should also provide ventilation—be "breathable".**
- **Protect head, feet, hands, and face. Keep dry.**
- **Cover your head. Up to 40 percent of body heat can be lost when the head is exposed.**
- **Footgear should be insulated to protect against cold and dampness.**
- **Dress in layers, wearing warm, waterproof/resistant clothing.**
  - An outer layer to break the wind and allow some ventilation (like Gore-Tex® or nylon).
  - A middle layer of wool or synthetic fabric (Qualofil or Pile) to absorb sweat and retain insulation in a damp environment. Down is a useful lightweight insulator; however, it is ineffective once it becomes wet.
  - An inner layer of synthetic weave to allow ventilation. Synthetic materials such as supplex and coolmax are ideal because they keep you warm and dry.

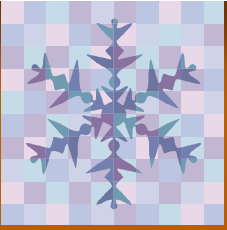




# Avoid Slips and Falls



- Walking on snow or ice is especially treacherous and wearing proper footwear is essential. Your normal work boots may not be adequate.
- A pair of well insulated boots with good rubber treads is a must.
- Wear ice cleats on icy areas prior to or during cleanup.
- When walking on an icy or snow-covered walkway, take short steps and walk at a slower pace so you can react quickly to a change in traction.
- Clear walkways of ice and snow and/or apply sand and salt as soon as possible. This is a hazard that must be addressed prior to starting work like any other.
- Walk carefully inside buildings when you have wet boots. Brush snow off or remove wet boots. Walk carefully on wet floors inside buildings.



# Other Hazards

- Be on the lookout for vehicles that may have lost traction and are slipping towards you (or bears).
- Equipment may act very differently in extreme cold or icy conditions. Your beginning of shift and pre-op inspections should take this into consideration. Be sure equipment operators know what to expect.



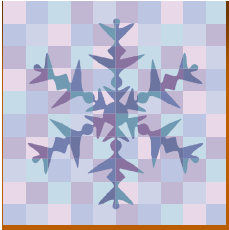


# Shoveling Snow



The National Safety Council offers the following tips for safe shoveling:

- **Push the snow as you shovel.** It's easier on your back than lifting the snow.
- **Don't pick up too much at once.** Use a light shovel (e.g. aluminum). Use a small shovel, or fill only one-fourth or one-half of a large one.
- **Lift with your legs bent, not your back.** Keep your back straight. By bending and "sitting" into the movement, you'll keep your spine upright and less stressed. Your shoulders, torso and thighs can do the work for you.
- **Take it slow!** Shoveling (like lifting weights) can raise your heart rate and blood pressure dramatically; so pace yourself. Be sure to stretch out and warm up before taking on the task.
- **Do not work to the point of exhaustion.** If you run out of breath, take a break. If you feel tightness in your chest, stop immediately. Individuals over the age of 40, or those who are relatively inactive, should be especially careful.
- If you have a history of heart trouble, do not shovel without a doctor's permission.
- Avoid shoveling after eating. Do not smoke while shoveling.



# Heating Equipment Safety

- Follow proper procedures, safety rules and manufacturer's recommendations just as you would with any tools or equipment and circumstances.
  - Electric heaters must meet the same standards as other electrical equipment; three prong plugs, etc.
  - Use proper fuels in heaters and ensure they are working properly. Guard against the build up of harmful fumes/gases in enclosed areas.
  - Ensure proper clearance around heaters or fire barrels. Remember, 25 feet from combustible materials.
  - If burning waste materials, be certain they are not contaminated with toxic or explosive elements.

